

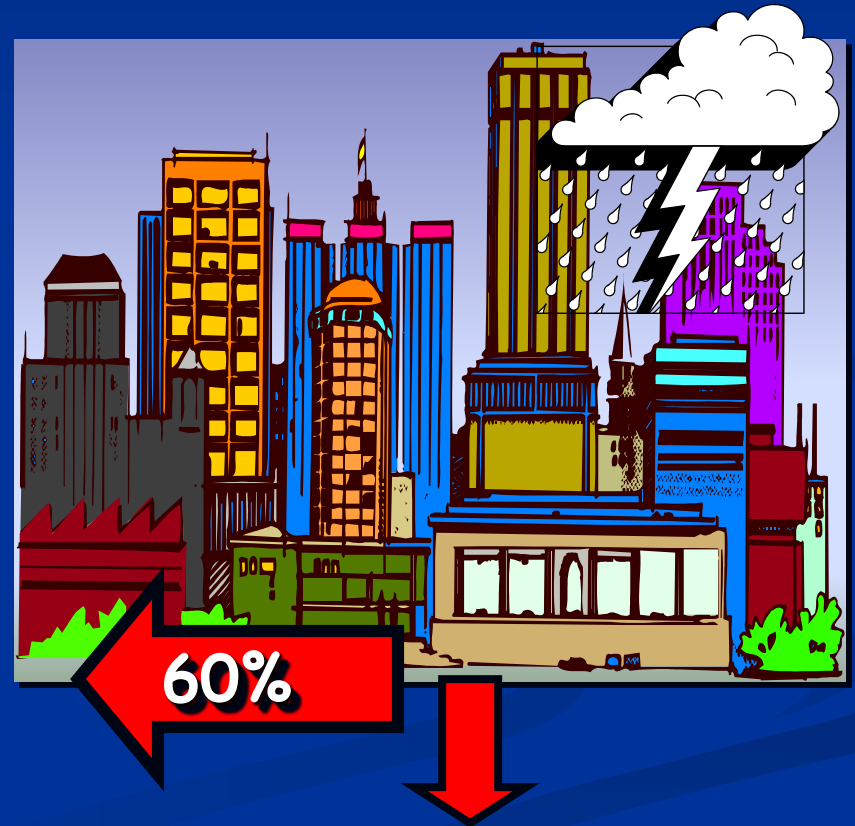
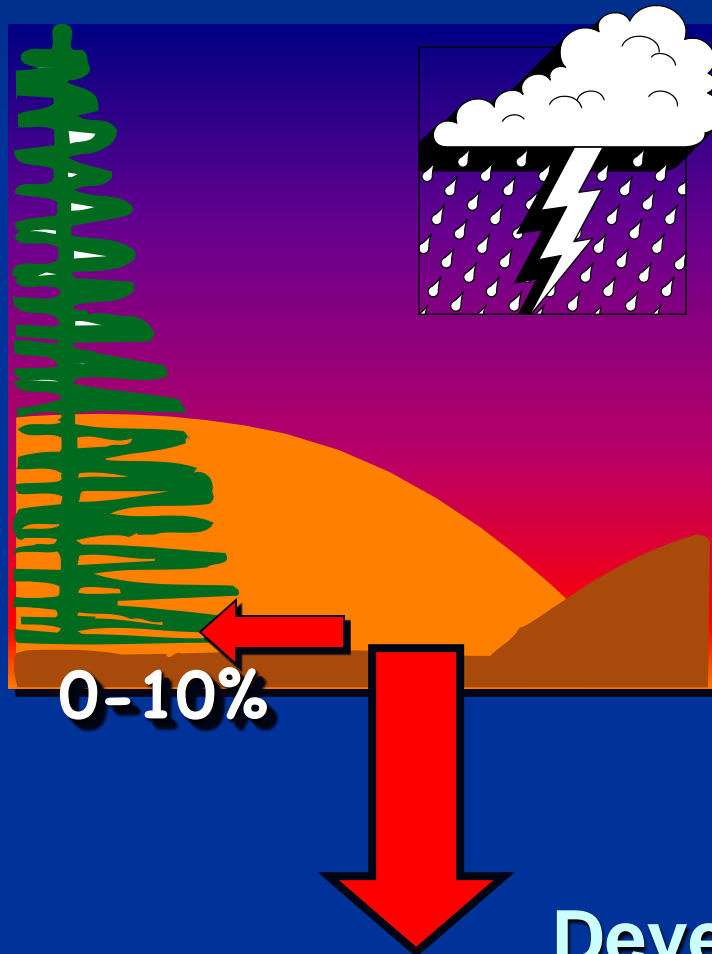
NPDES Stormwater Rulemaking



U.S. Environmental Protection Agency
Office of Wastewater Management
Region 5 (Chicago Office)

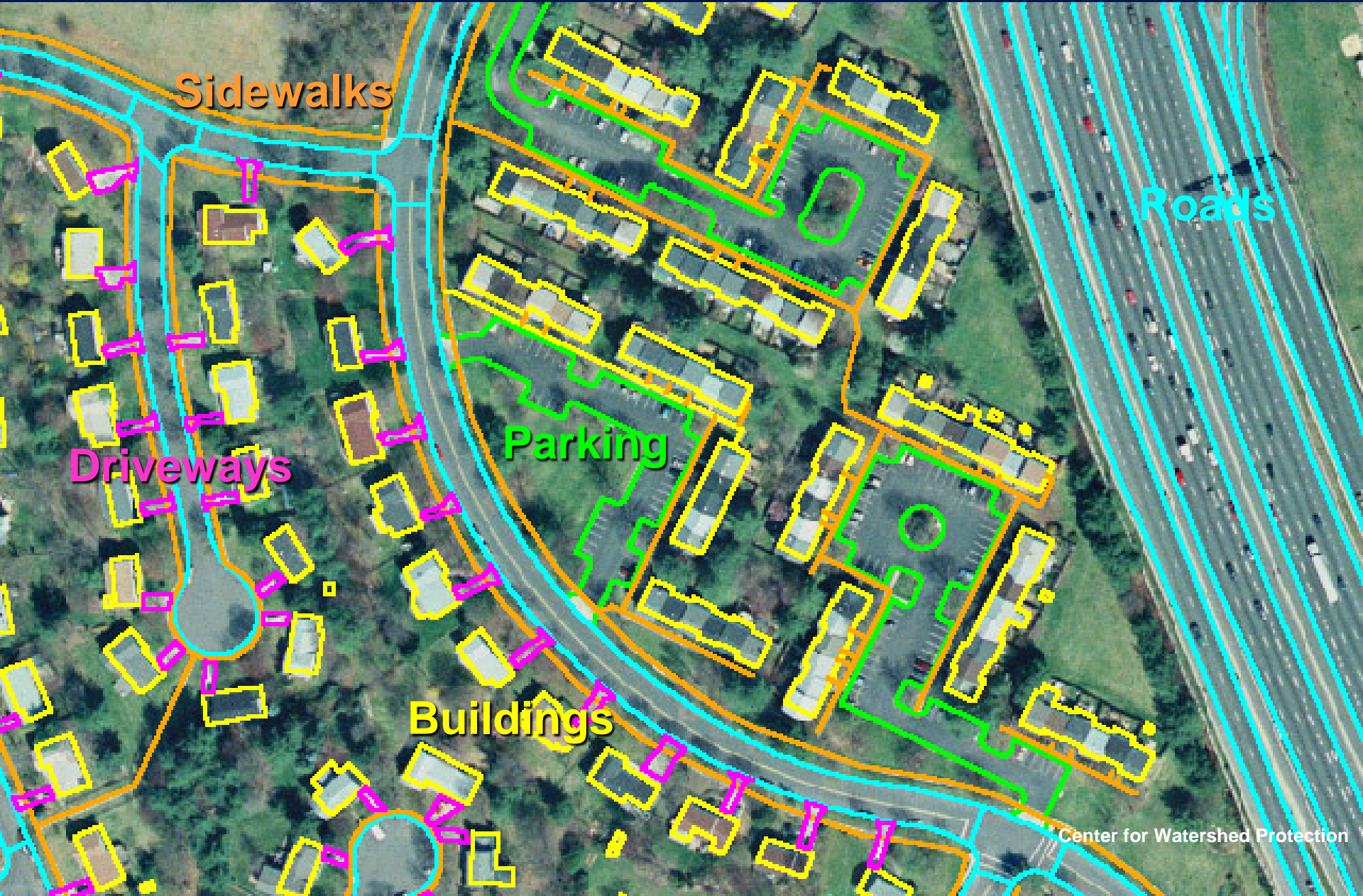
March 31, 2010

Relationships Between Land Use and Water Resources



Development Increases Run-off

Increased Run-off due to **Impervious Surfaces**



~10% Impervious Surfaces

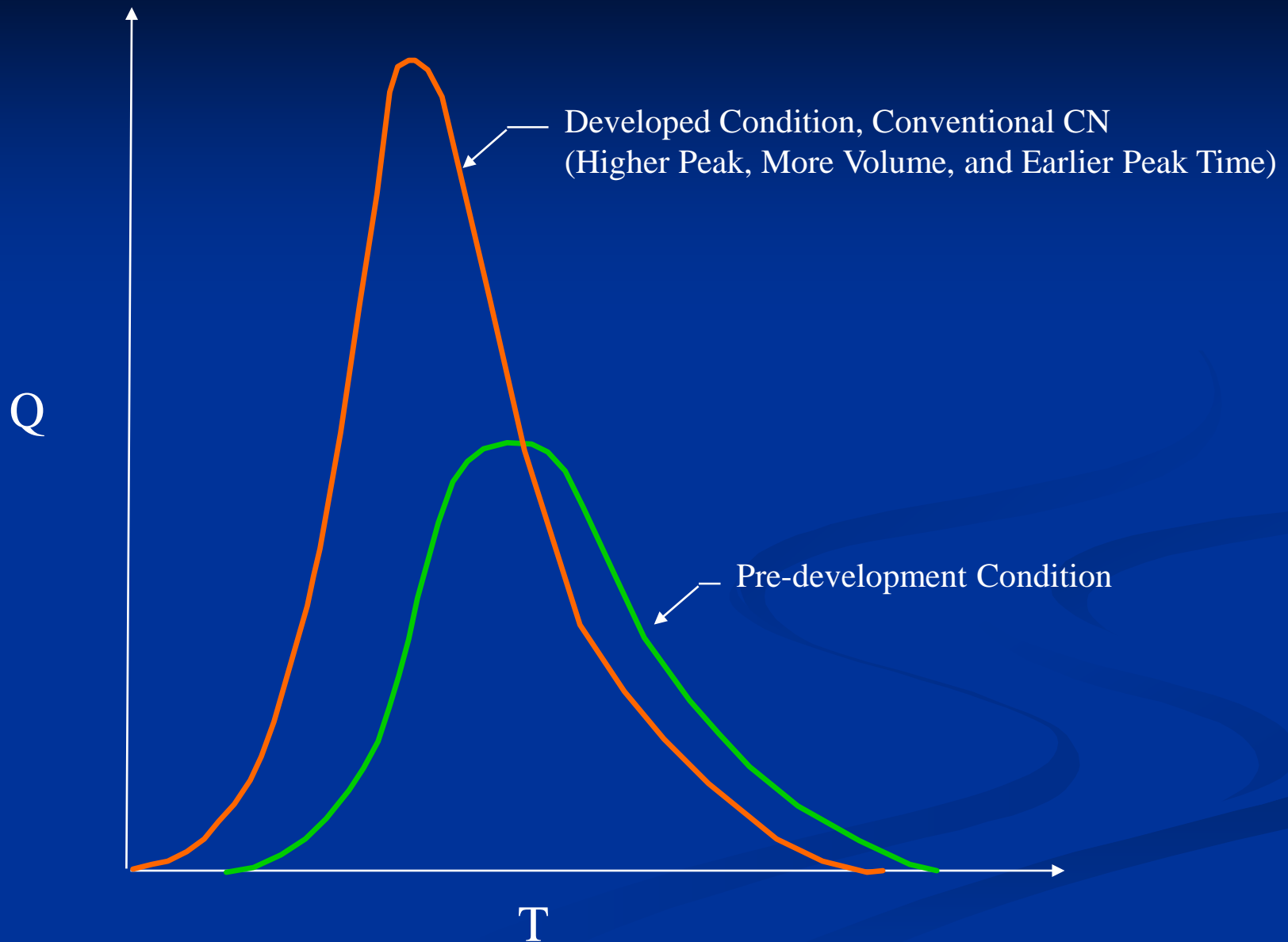
As a Watershed Develops, there is More and More Impervious Cover (and as a result, more and more runoff)



An aerial photograph of a suburban watershed area, outlined by a thick black line. The area is densely packed with residential buildings, streets, and parking lots, indicating a high percentage of impervious surfaces. The text '~ 75% Impervious Surfaces' is overlaid in yellow. The surrounding area outside the outline shows more natural, undeveloped land.

~ 75% Impervious Surfaces

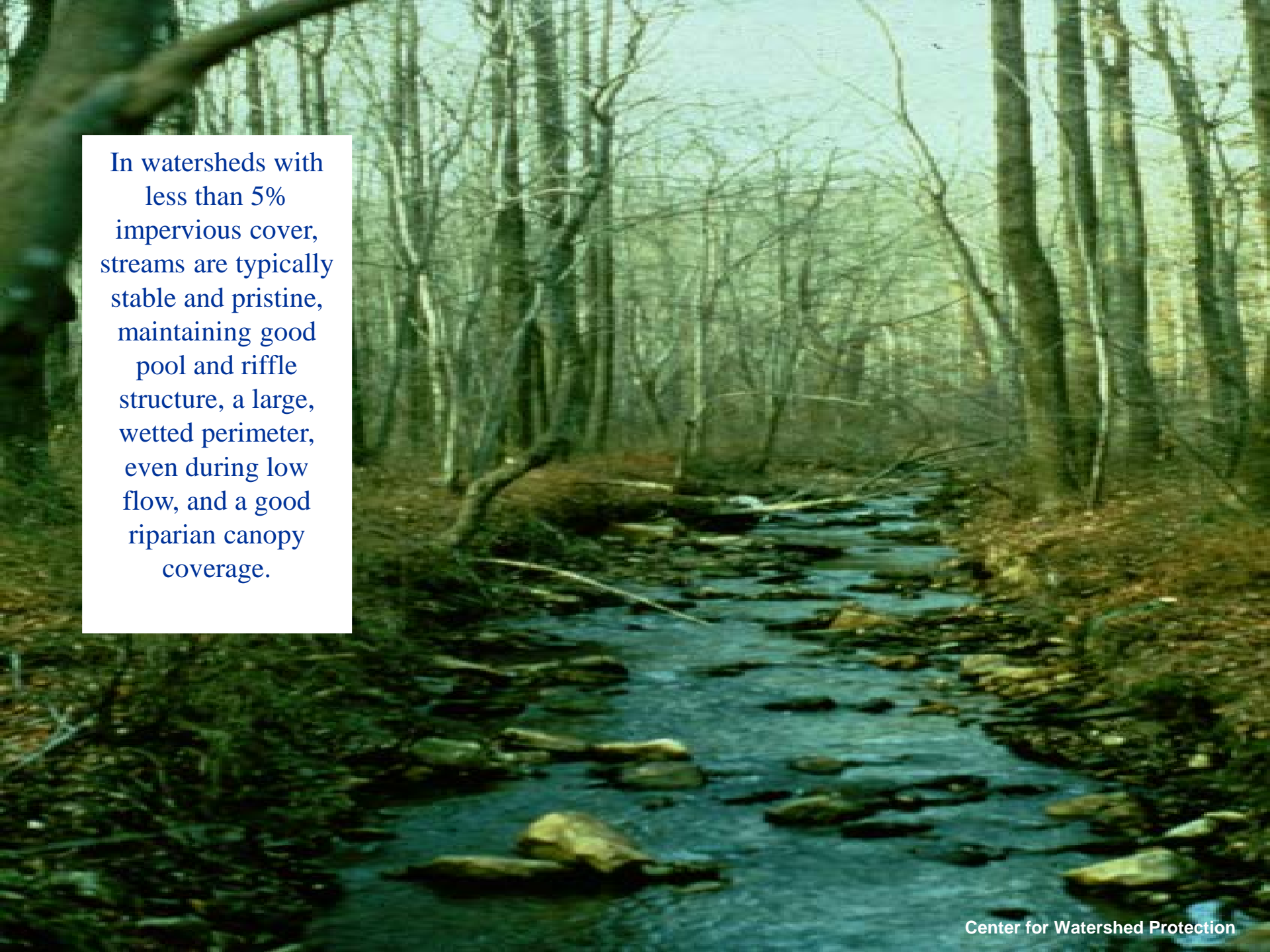
Increased Run-off Changes Stream Flow Characteristics



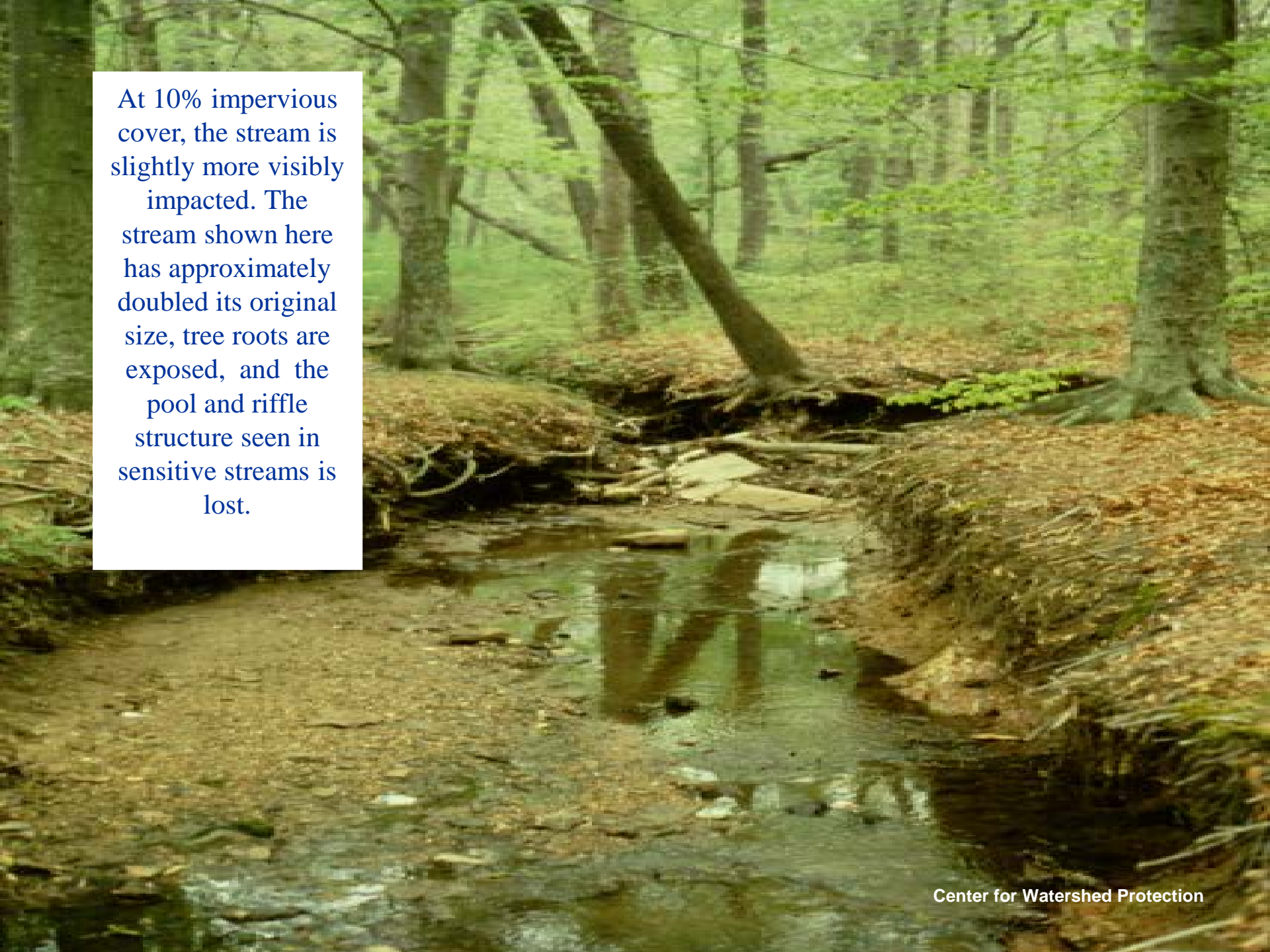
Effects of Higher Flow Volumes and Higher Flow Velocities...

- Stream widening and erosion
- Decreased channel stability
- Reduced fish passage
- Loss of pool-riffle structure
- Lower summer base flows
- Loss of riparian tree canopy
- Temperature impacts
- Decreased substrate quality

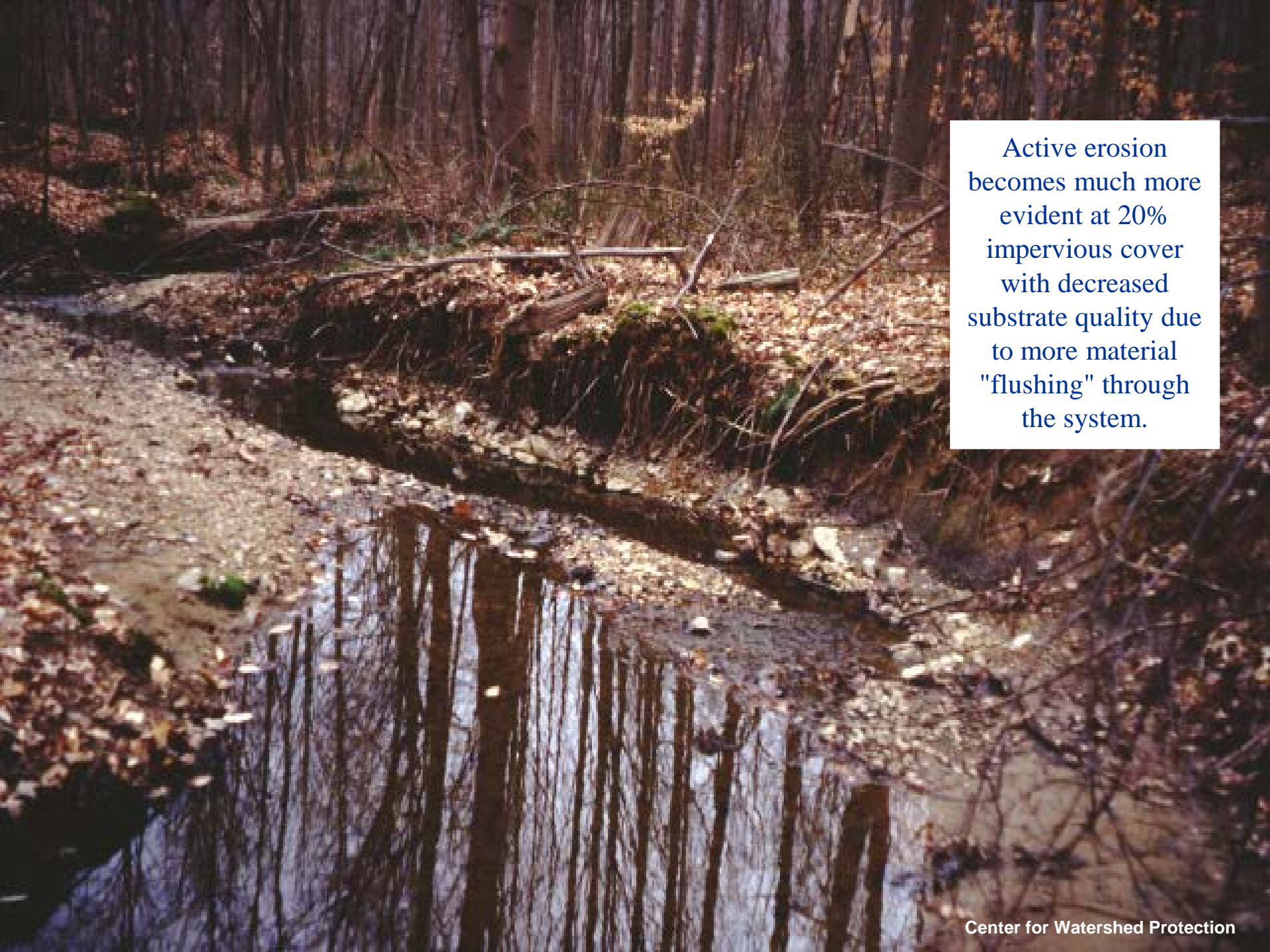




In watersheds with less than 5% impervious cover, streams are typically stable and pristine, maintaining good pool and riffle structure, a large, wetted perimeter, even during low flow, and a good riparian canopy coverage.

A photograph of a stream in a forest. The stream is wide and shallow, with a pool of water in the foreground. The water is dark and reflects the surrounding trees. The stream bed is composed of rocks and fallen leaves. Large tree roots are exposed along the banks, and the forest floor is covered in a thick layer of brown leaves. The trees are tall and thin, with green foliage in the background.

At 10% impervious cover, the stream is slightly more visibly impacted. The stream shown here has approximately doubled its original size, tree roots are exposed, and the pool and riffle structure seen in sensitive streams is lost.



Active erosion becomes much more evident at 20% impervious cover with decreased substrate quality due to more material "flushing" through the system.



The surrounding area of this stream is also approximately 20% impervious cover.

Erosion is more severe here due to the absence of vegetation to hold together bank structure.

Stormwater Challenges

Much progress has been made; however, significant challenges remain to protect water bodies from impact of stormwater discharges



- **Urban stormwater is the primary source of water quality impairments:**
 - **13% of all rivers and streams**
 - **18% of all lakes**
 - **32% of all estuaries**



National Research Council Report

Urban Stormwater Management in the United States

“Presently the regulation of stormwater is hampered by a statute that focuses primarily on specific pollutants and largely ignores the volume of discharges”

KEY NRC Report Recommendations

- **“A straightforward way to regulate stormwater contributions to waterbody impairment would be to use flow or a surrogate, like impervious cover, as a measure of stormwater loading”**
- **“Efforts to reduce stormwater flow will automatically achieve reductions in pollutant loading. Moreover, flow is itself responsible for additional erosion and sedimentation that adversely impacts surface water quality.”**
- **“Stormwater control measures that harvest, infiltrate, and evapotranspire stormwater are critical to reducing the volume and pollutant loading of small storms.”**

What Measures Could Be Implemented to Meet Performance Standards?

Green infrastructure practices to manage stormwater

- **Increase Infiltration**
- **Increase Evapotranspiration**
- **Harvest and Re-use Stormwater**
- **Reduce Volume of Runoff**

**Consistent in
concept with MIDS**



Green Infrastructure Practices in MN



Maplewood



H.B.Fuller Company Parking Lot



Burnsville



Minneapolis Library

Examples

Language in State Rules/Stormwater Permits Wisconsin

- NR151 Performance standards include requirements for total suspended solids, peak flow, infiltration
- **Infiltration.** This performance standard requires that, to the MEP, a portion of the runoff volume be infiltrated:
 - Residential – 90 percent of pre-development infiltration volume or 25 percent of the 2 year-24 hour design storm.
 - Non-residential – 60 percent of predevelopment infiltration volume or 10 percent of the 2 year-24 hour design storm.
- To protect groundwater, the WI standards identify areas where infiltration is discouraged

Ohio – Big Darby Watershed

- **Groundwater Recharge Requirements.**
The SWPPP shall ensure that the overall site post-development groundwater recharge equals or exceeds the pre-development groundwater recharge



New Jersey

The New Jersey Stormwater Management Rules require that a “major development” project must comply with one of the following groundwater recharge requirements:

- *Demonstrate through hydrologic and hydraulic analysis that the site and its stormwater management measures **maintain 100 percent of the average annual preconstruction groundwater recharge volume for the site**; or*
- *Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from pre-construction to post-construction for the 2-year storm is infiltrated*

North Carolina

**Permit to Construct, Operate and Maintain
Impervious Areas and BMPs Associated with
Residential Development Disturbing < 1 acre**

*Use rain barrels, rain gardens,
permeable pavements, and/or other
stormwater best management practices
to control and treat the stormwater
runoff from all built upon areas of the
site from the first 1.5 inches of rain*

Stormwater Runoff Requirements for Federal Development Projects

The sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to **maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow**

Minnesota CGP

- All stormwater must be discharged in a manner that does not cause nuisance conditions, erosion in receiving channels or on downslope properties, or inundation in wetlands.
- Where a project's ultimate development replaces vegetation and/or other pervious surfaces with 1 or more acres of cumulative impervious surface, a water quality volume of ½ inch of runoff from the new impervious surfaces must be treated prior to the runoff leaving the construction site/entering surface waters.
- Infiltration/Filtration options include but are not limited to: infiltration basins, infiltration trenches, rainwater gardens, sand filters, organic filters, bioretention areas, enhanced swales, dry storage ponds with underdrain discharge, off-line retention areas, and natural depressions. Infiltration must be used only as appropriate to the site and land uses.

EPA Initiated Stormwater Rulemaking

- **Primary impetus – protect waterbodies from stormwater impact of urbanization**
- **Oct. 30, 2009 - Federal Register (FR) notice announcing EPA's intent to distribute questionnaires (Information Collection Request (ICR)) seeking data to inform the rulemaking from the following groups:**
 - **Owners, operators, developers, and contractors of developed sites**
 - **Owners or operators of MS4s**
 - **States and territories**
- **Jan. – Mar. 2010 – Listening Sessions input on preliminary rulemaking considerations (FR Notice published Dec. 28, 2009)**
- **Spring 2010 – EPA expects to publish a final FR ICR notice with 30-day comment period and distribute questionnaires in the summer**
- **Late 2011 – EPA expects to propose a rule to be published in the FR for public comment**
- **Late 2012 – EPA expects to take final action**

Informing the Rulemaking

Information on Stormwater Practices



- **Design, performance, operation and maintenance, capital and lifetime cost for stormwater retention practices used to control discharges from new development, redevelopment and retrofit.**
- **Cost comparisons of different stormwater management approaches for specific sites.**
- **Monitoring information that may have been collected to show the impacts of stormwater control measures on water quality and/or flow rates in the receiving waterbody.**

- ✓ **Discuss Key Rulemaking Considerations**
- ✓ **Summarize What We Heard During the Listening Sessions**
- ✓ **Solicit Input From You On These Topics and Any Other Comments You Would Like To Offer**



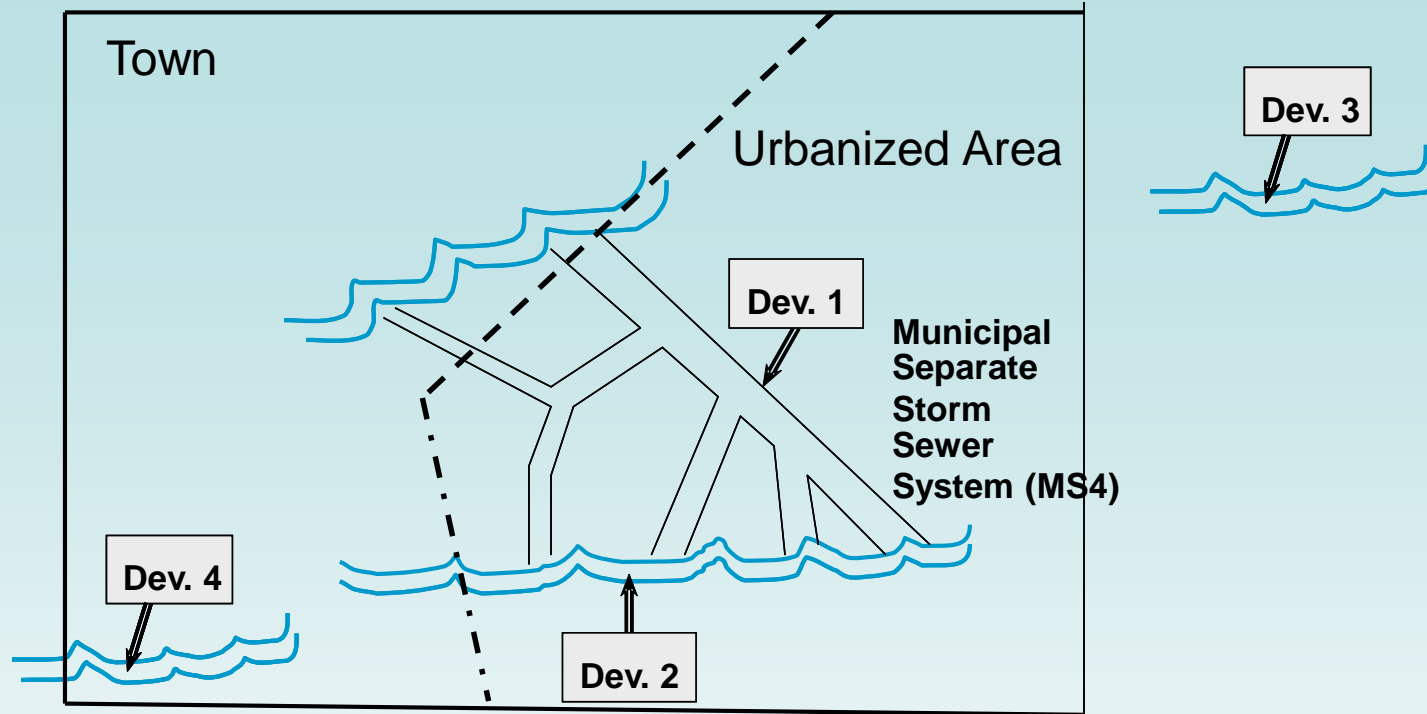
Preliminary Rulemaking Considerations

- **Expand the universe of regulated discharges beyond urbanized areas**
- **Establish substantive post-construction requirements for new and redevelopment**
- **Develop a single set of consistent requirements for all MS4s, in place of existing “Phase I” and “Phase II” rules**
- **Address stormwater discharges from existing development through retrofitting**

1. Expand the universe of regulated discharges beyond urbanized area



- Regulated small MS4s limited to Urbanized Area (UA) boundary as defined by the U.S. Census,
- Federal regulations cover only 2% of total U.S. land area, while much development is occurring outside covered areas
- Some states have designated additional separate storm sewer systems as regulated MS4s.



- What is the best way to expand the universe of regulated discharges beyond Urbanized Area?
- Is there an appropriate jurisdictional boundary for permit coverage, such as municipality or county?
- What criteria could be used to identify areas (e.g., % of impervious cover)?
- Should States decide the areas to include?
- In addition to expanding area should EPA consider regulating stormwater discharges from particular types or sizes of development that are not covered by an MS4 permit?

MS4 coverage in Minnesota

- **Mandatory MS4s:** MS4s in urbanized areas as defined by the Census are required to obtain a NPDES/SDS stormwater permit.
- **Designated MS4s:** MS4s outside of urbanized areas that have been designated by the MPCA for permit coverage under Minn. R. ch 7090 are required to obtain a NPDES/SDS stormwater permit.
 - MS4s designated by rule are cities and townships with a population of at least 10,000; and cities and townships with a population of at least 5,000 and discharging or the potential to discharge to valuable or polluted waters.
 - These designated MS4s were required to obtain permit coverage by February 15, 2007.
 - The rules also establish criteria that can be applied to designate future MS4s under a designation process identified in the rule.
- **Petition MS4s:** MS4s that are designated through the petition process (under Minn. R. ch. 7090) are required to obtain a NPDES/SDS stormwater permit. The public can petition the Commissioner for the designation of an MS4 based on the designation criteria established in the rules.

Listening Sessions

Expanding the Area Subject to Federal Stormwater Regulations

- **Support for expanding coverage to include non-UAs**
- **Support for expanding the boundaries, get ahead of development**
 - **Retrofits are more expensive than doing it right the first time.**

2. Establish substantive post-construction requirements for new and redevelopment

- Develop a standard that promotes sustainable practices that mimic natural processes to infiltrate and recharge, evapotranspire, and/or harvest and reuse precipitation.**
- Should there be a national requirement for on-site stormwater controls such that post development hydrology must mimic pre-development hydrology on a site-specific basis?**
- Options for meeting the requirement could be: on-site retention of specific sized storm, limits on amount of effective impervious area, use of site-specific calculators to determine predevelopment hydrology, and/or use of regional standards to reflect local circumstances.**
- Should the standards be different for new development vs. redevelopment?**

Listening Sessions

Post-Construction Standards

- **EPA should set endpoints, let local technical experts determine how to get there**
- **Decisions should reflect local conditions – not ‘one-size-fits-all’**
 - **Must have great flexibility in LID applications (based on local soils, rainfall, etc.)**
- **On-site controls will not work in many areas. There were many requests for opportunities for regional controls.**
- **Stormwater discharges should be controlled using watershed boundaries**
 - **May be a role for Councils of Governments**
- **Is EPA mandating green infrastructure?**
- **May need to reconcile green infrastructure and western water law (water rights - infiltration reduces the discharges received by the downstream neighbor)**

Listening Sessions –

Green Infrastructure Practices

- **Need more data on the effectiveness and durability of GI practices**
- **EPA needs to provide more education and conduct research**
- **Lack of knowledge/experience among many engineers, developers and others as to how to use and integrate GI in site design**
- **Ecologists, soil scientists, and others, not just engineers, should be involved in design**
- **Green infrastructure practices/LID designs can be less expensive as compared to traditional methods**
- **Some worry that GI will hamper development**
- **Plumbing codes in some areas are a barrier to stormwater re-use**
- **Maintenance and accountability needs for GI have to be determined – who will be responsible, and how will practices be managed?**

3. Develop a single set of consistent requirements for all regulated MS4s

- Many Phase I & II MS4s address issues that are similar, but the regulatory requirements are different.**
- Should EPA apply the requirements to all MS4s?**
- Should EPA apply 6 minimum measures to Phase Is?**
- Phase I MS4s are required to implement a program to control discharges from industrial facilities. Should this requirement be extended to all MS4s?**
- What additional requirements should be considered?**

Listening Sessions

Consolidating Phase 1 and Phase 2

- **General support for developing a single set of regulations for both Phase I and II.**
- **Most Phase I's are doing the six minimum measures now.**
- **Some uncertainty whether small MS4s have the staff and expertise to do industrial inspections and monitoring requirements in the Phase I rule.**
- **Issues with dealing with individual vs. general permits.**

4. Addressing stormwater discharges from existing development

- **Stormwater discharge from developed areas is a significant contributor to water quality impairments.**
- **Some MS4 permits require retrofit practices that infiltrate or otherwise retain stormwater.**
- **Some cities are implementing retrofit practices to control CSOs.**
- **Should EPA consider retrofit requirements?**
 - **Development of a retrofit plan?**
 - **Should we start with large MS4s?**
 - **Should we require Implementation of the plan?**
 - **Limit to water quality impaired waters?**

Listening Sessions

Retrofitting

- **Retrofitting of existing structures/sites in highly urbanized areas is essential to effect any meaningful improvements in water quality**
- **Retrofitting may be too difficult, complex, and expensive**
- **Significant support for retrofit program.**
 - **Don't place all of the burden on new and redevelopment**
 - **Existing development is causing much/most of the problem.**
- **However, there are many concerns about cost, implementation, compliance and enforcement of the rule when cities are in economic recession.**

Listening Sessions

General Comments/Themes

- **Requirements for redevelopment should include incentives to account for cost and site constraints**
- **There is insufficient focus on the cumulative effects of NOT doing anything (dangers of status quo not appreciated)**
- **Need for better enforcement of existing rules**
- **Could new regulations be phased-in over time?**
- **Clear guidance from EPA will be necessary for this rule to be effective**
- **Lots of support for pre/post hydrological matching**
- **Watershed permitting approaches should be considered**
- **Determining what constitutes a “sensitive area” is difficult, could lead to disputes**

Listening Sessions

Economic Considerations

- **Current budget crises/economic downturn make this a poor time to implement new requirements**
- **Federal government should provide funding**
- **Stormwater utilities, specific taxes, and other designated revenue sources should be implemented as funding source**

Further Information/ Track Federal Rulemaking

www.epa.gov/npdes/stormwater/rulemaking

Listening Session Webcast is online

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